Geology and the War

National Park Service
U.S. Department of the Interior

Manassas National Battlefield Park

How the geology surrounding Bull Run shaped the Battles of Manassas

Geology comprises the study of rocks, and in turn rocks constitute the basic building blocks of the world. The landscapes around us are a reflection of how these building blocks react to nature. Through wind and rain, the rocks are reshaped, transformed, and transported, creating hills, ridges, valleys, and channels.

Mankind is forced to react to the surrounding landscape and work with and around nature to build cities, establish transportation networks, and exploit natural resources. During times of warfare it's crucial for mankind to identify all three and how they're connected over a larger landscape.

During the first and second battles of Manassas, the familiar landscape surrounding Bull Run became an important ally to the confederate forces and consequently an enemy to the Federals. The Confederate forces were able to use their knowledge of the unique landscape surrounding Bull Run to secure strategic defense posts and stall Federal advancement.

The battlefields of Manassas extend across several ridges and hills carved by streams and creeks. The majority of the first battle of Manassas was fought along ridges of siltstone and shale, providing defensive locations overlooking the low-lying valleys and roadways. The second battle, however, was fought along Stoney Ridge, named for the underlying diabase dike, providing a view of the entire battlefield as well as access to the unfinished railroad grade to the Northeast.

Before charging into battle though, it was important for both sides to have a strategy. The Confederate strategy was one of defense, using the deep channel of Bull Run as a barrier against Federal advancement and using the hills and ridges as lookout posts. The Federal Strategy was one of attack, using the fords along Bull Run to cross over to Manassas Junction and the carved valleys as a path into battle.

Thus, knowledge of streams, fords, hills, and ridges proved crucial in securing strategic positions during the two battles. The lack of accurate maps of the area ultimately hindered the Federals, but both forces understood the power behind using the landscape during a battle.

View of Brawner Farm from Stuart Hill

Fords

Exposed bedrock ford along Dogans Branch

As Federal Troops advanced toward Manassas Junction, General Beauregard knew that the only way to cross Bull Run was by fords or shallow crossing points created by elevated bedrock. These shallow points are usually caused by a change in rock type or a local variation in erosion rates.

Familiar with these fords, Beauregard positioned his men at their various locations along an eight-mile stretch of Bull Run. By controlling these fords, Beauregard controlled the Federal advance.

Hills

View of Henry Hill from the Stone House

Hills, like ridges, were strategic high points carved by streams and creeks. As water flows downstream it incises down into the bedrock, creating steep slopes and flat, elevated, plateaus.

Some of the most important hills during the two battles are Henry Hill, the Van Pelt Hill, Stuarts Hill, and Buck Hill. Each of these hills served as defensive posts where Generals and commanders could look out over the battlefield.

Ridges

View of Stoney Ridge

Ridges, like hills, were strategic high points carved by streams and creeks. Most of the ridges are carved from the siltstone, shales, and sandstones of the Groveton member, fostering a consistent elevation of about 80m above sea level.

The one exception is Stoney Ridge which is carved from diabase and sits at an elevation of approximately 100m above sea level. The higher elevation of the diabase ridge is caused by its greater level of resistance to erosion.

Creeks & Streams

View of Bull Run

Several creeks and streams flow through the Manassas Battlefield, eventually flowing into Bull Run which then flows into the Rappahannock River. Most of these waterways are surrounded by steep slopes , exposing the underlying rocks.

During the first and second battle of Manassas these waterways served as barricades, blocking the quick and easy movement of troops across the battlefield. The only way to cross most of the waterways were by fords.

Building Blocks of Manassas

Rocks are not only earth's building blocks, but man's as well. Throughout history rocks of various types have been quarried, carved, ground, and stacked in order to construct various structures. The deep red sandstones and siltstone of the Culpepper Rift basin were of no exception.

This rock was quarried throughout the rift basin, starting almost 200 years ago. Although the stone is no longer quarried, some of the sandstone structures still stand. The quarried stone was dominantly used in structural foundations with only the wealthy members of society having the means to construct a complete stone house.

Within the Manassas National Battlefield Park, we have two key structures constructed from local sandstone with other historical buildings with sandstone foundations. The Stone Bridge, crossing Bull Run, has been reconstructed several times from its original state using local sandstone. This bridge served as a crucial crossing point during the Federal retreat of both battles. The stone house, located between Henry and Buck hill, has a variety of locally quarried sandstone and siltstone bricks. This house served as a Federal hospital during both battles.

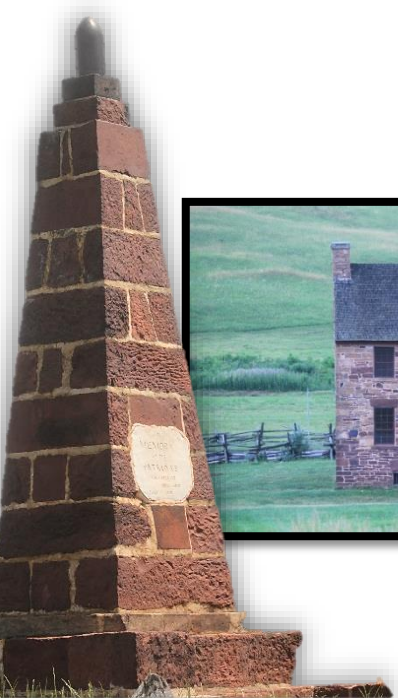
Upon close inspection, you'll find that each brick is unique texture and holds its own little secrets. Some of the stones display cross-bedding, others contain fossilized burrows, and most of the blocks still show markings from the quarry.

Following the war, Union soldiers constructed two different monuments using local sandstone in order to commemorate the patriots who lost their lives during the battle of Bull Run and the Battle of Groveton. These monuments can be found on standing on Henry Hill and at Deep.

Diabase, found on the western edge of the park, was also a crucial resource used in the construction of the unfinished railroad that runs through the park. This rock is much more resistant to the elements and thus lasts longer as a building material. However, its higher level of durability also makes it harder to quarry as blocks like the sandstone and siltstone.

Back in 1995 an Archaeological survey completed by Gray & Pape Inc. discovered an abandoned diabase quarry within park boundaries. This quarry had evidence of two grinding platforms, wagon trails leading away from the quarry, and rocks scarred by drills and hammers.

The quarried and ground-up diabase was taken east along the railroad grade to act as fill. Even though the railroad was never finished this fill ultimately proved useful as back-up ammunition for the Confederate forces during the second battle of Manassas.



Left: Groveton Monument near Deep Cut
Up: View of Stone House from Buck Hill
Center: Close up view of Stone House bricks
Right: North View of Stone Bridge